

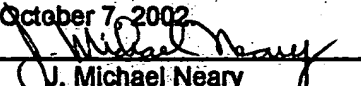


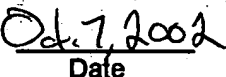
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF TRANSMISSION

I hereby certify that I am transmitting this document, along with all documents referred to as attached thereto, to the Commissioner for Patents by telephone facsimile at telephone number (703) 305-7687 on October 7, 2002.


J. Michael Neary


Date

Inventor: Gabrys & Simmons)
Serial No.: 09/630,157)
Filed: July 31, 2000)
For: "Flywheel Hub-to-Rim Coupling")
Group Art Unit: 3682
Examiner: Chong Hwa Kim

October 7, 2002

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GROUP 3600

AFFIDAVIT OF DENNIS SIMMONS UNDER RULE 132

Honorable Commissioner for Patents
Washington, DC 20231

Sir,

1. My name is Dennis Simmons and this is my affidavit of facts and opinions in support of the patentability of the claims in the above-identified application.

2. I am now and since October 3, 1996, have been the Sr. Process Engineer of Composites Development Center at Toray Composites (America), Inc. in Tacoma, Washington, assignee of this Application. Prior to that time, from November 4, 1966 to October 3, 1996, I was employed at Lincoln Composites in Lincoln, Nebraska in various production and management positions.

3. I am familiar with the disclosure and claims in this Application which covers an invention made by my co-inventor and I, and I have read and am familiar with the Examiner's Final Rejection dated June 7, 2002. I believe that the basis for the Examiner's conclusions that the inventions claimed in this application are unpatentable

are factually and technically incorrect. I will explain the reasons for these conclusions in detail below.

4. Claims 1-8 and 10-20 have been rejected as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and use the invention. Specifically, the Examiner asserts that the variables dealing with the characteristics of each material used are not provided in the specification, and he further asserts that, without the exact composition of the material and its values, such as modulus of elasticity or density, making the invention is very difficult to carry out.

5. The specification, in the first two paragraphs on page 7, explains the relationship between the rim liner materials and the rim materials as follows:

The rim liner 45 is made of a material such as nylon or PVC that has a elastic modulus in the hoop direction, E_l (hereinafter referred to as the "hoop modulus") selected to provide a ratio R_l of hoop modulus to density $E_l/\rho_l = R_l$ that is lower than the corresponding ratio $R_r = E_r/\rho_r$ for the rim materials. For rims having several materials such as glass and carbon fiber, the ratio $R_r = E_r/\rho_r$ that should be used for the purposes herein is larger value of any of the materials in the rim. This relationship ensures that when the inner diameter of the rim 40 grows radially away from the hub at high rotational speeds, the rim liner grows with it.

The rim liner is made from a material that has sufficient strength to transmit the torque between the hub and the rim liner during spin-up of the flywheel and during energy recovery from the flywheel, and has an elastic modulus and elongation capacity in the hoop direction that will allow the rim liner to grow with the composite rim when spun to high speed. Materials that will work have a ratio R_l that is lower than the corresponding ratio for the rim materials, ensuring that the rim liner grows with and stays in contact with the rim during high speed operation. Examples include various plastics and also brass.

6. To produce a flywheel system and hub in accordance with the invention, a person of ordinary skill in the art would need to know the modulus of elasticity E_r and the density ρ_r of the rim materials and the corresponding modulus of elasticity E_l and the density ρ_l of the rim liner materials. This information is available from the suppliers of such materials. An example of the calculations used to obtain the values of E_r and ρ_r

of the rim, and E_r and ρ_r of the rim liner is provided in the attached Exhibit A, and the sources of publicly available information for the material properties of the typical flywheel materials are attached to the Exhibit A as Attachments 1-4.

7. In my opinion, all the information needed to practice the invention is taught by the specification of this application, and the properties of the materials to be used in the flywheel rims and rim liners are readily available from material suppliers and other publicly accessible sources, as exemplified in the Exhibit A and its Attachments.

8. In summary, I believe that the invention of this patent application solves a problem that the best minds in the field were unable to solve and teaches how to make and use the invention in clear and simple terms that are entirely sufficient to enable one of ordinary skill in the art to make and use the invention.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent that issues thereon.

Dennis Simmons
Dennis Simmons ☐

10/7/2002
Date ☐